**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 5 | STRAND: Numbers and Algebra | **SUB-STRAND:** Patterns and Algebra 2 | **WORKING MATHEMATICALLY:** MA1-3WM, MA3-2WM, MA3-3WM |
| OUTCOMES: MA3‑8NA | Analyses and creates geometric and number patterns, constructs and completes number sentences, and locates points on the Cartesian plane  |
| **CONTENT:**  | * **Continue and create sequences involving** [**whole numbers**](http://syllabus.bos.nsw.edu.au/glossary/mat/whole-number/?ajax)**,**[**fractions**](http://syllabus.bos.nsw.edu.au/glossary/mat/fraction/?ajax) **and** [**decimals**](http://syllabus.bos.nsw.edu.au/glossary/mat/decimal/?ajax)**; describe the rule used to create the sequence (ACMNA133)**

\* Continue and create number patterns, with and without the use of digital technologies, using whole numbers, fractions and decimals, e.g. 1 4  , 1 8  , 1 16  , … or 1.25, 2.5, 5, … \* Describe how number patterns have been created and how they can be continued (Communicating, Problem Solving)  |
| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | <http://worksheets.mathsbuilder.com.au/worksheets/Patterns_and_Algebra/5/#5_01> OR <http://worksheets.mathsbuilder.com.au/worksheets/Patterns_and_Algebra/6/>  |
| WARM UP / DRILL |  |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | * On the first day after buying a new big screen TV you watch 80 minutes of TV. Your Mum tells you to halve the amount of time each day you spend watching.

a) How much TV do you watch on second day?b) On which day would you be watching only 5 minutes of TV?  |
| QUALITY TEACHING ELEMENTS | **INTELLECTUAL QUALITY** | **QUALITY LEARNING ENVIRONMENT** | **SIGNIFICANCE** |
| Deep knowledgeDeep understandingProblematic knowledgeHigher-order thinkingMetalanguageSubstantive communication | Explicit quality criteriaEngagementHigh expectationsSocial supportStudents’ self-regulationStudent direction | Background knowledgeCultural knowledgeKnowledge integrationInclusivityConnectednessNarrative |
| RESOURCES | See throughout… |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| * **GEOMETRIC PATTERNS**

Discuss patterns and how they are found in the real world. Explore structures, flora and fauna etc. See: <http://everydaylife.globalpost.com/real-life-examples-math-patterns-elementary-students-7221.html> and <http://vimeo.com/22423987> Use concrete materials to create patterns and discuss the rules that apply.Explore 2D and 3D shapes and create patterns through the actual items and through drawings. <http://studyjams.scholastic.com/studyjams/jams/math/algebra/geometric-patterns.htm> (View with the class on the interactive whiteboard and practise some questions. Discuss.* **NUMBER PATTERNS**

Provide students with pop sticks or matchsticks. Ask them to make a series of rhombuses from the sticks. Students keep a record of how many sticks they have used altogether after each rhombus is added. Record the number of rhombuses they construct.As a class, create a table and record the data in the table.Ask students:* *Can you work out how many popsticks you would need if you wanted to make 15 rhombuses?*
* *What are some different ways you can work this out?*
* *Does the table help you work this out?*

*If I used 80 popsticks, how many rhombuses could I make*?<http://studyjams.scholastic.com/studyjams/jams/math/algebra/number-patterns.htm> (View with the class on the interactive whiteboard and practise some questions. Discuss. | LEARNING SEQUENCERemediationS2 | * Review Patterns and Algebra Stage 2 Units.

Model patterns in shapes and use concrete materials to recreate colour and shape patterns. Use these to create number patterns, e.g. Count the total number of sides and vertices etc. * **Building Patterns**

[*http://www.curriculumsupport.education.nsw.gov.au/secondary/mathematics/assets/pdf/s4\_teach\_ideas/algebra/pattern\_1.pdf*](http://www.curriculumsupport.education.nsw.gov.au/secondary/mathematics/assets/pdf/s4_teach_ideas/algebra/pattern_1.pdf)In this activity students make a geometric pattern involving one operation using matchsticks or counters, extend the pattern by three terms and write a number sentence to describe the pattern.* **Building Patterns**

[*http://www.curriculumsupport.education.nsw.gov.au/secondary/mathematics/assets/pdf/s4\_teach\_ideas/algebra/pattern\_2.pdf*](http://www.curriculumsupport.education.nsw.gov.au/secondary/mathematics/assets/pdf/s4_teach_ideas/algebra/pattern_2.pdf)This activity requires students to construct a series of buildings using square tiles, extend the series by one term and record the information in a table. |
| LEARNING SEQUENCES3 | * **Maths Interactive – Number Patterns** <http://www.bbc.co.uk/bitesize/ks2/maths/number/number_patterns/play/>
* **Balance the Blobs**

<http://streaming.lawley.wa.edu.au/students/TLF/DVD/los/L5979/index.html>  |
| LEARNING SEQUENCEExtension Early S4 | * **Guess My Rule**

A game to practise finding rules through spotting patterns. One person thinks of a rule about numbers and the others take turns to guess what the rule is. Example:<http://www.schools.nsw.edu.au/learning/7-12assessments/naplan/teachstrategies/yr2011/index.php?id=numeracy/nn_paal/nn_paal_s3a_11> |
| **EVALUATION & REFLECTION** | Ask students to evaluate their best learning style and reflect on the type of activities used. Use this information and data for further planning.  |